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ABSTRACT

When a person encounters a problem, the character, form, and content of his or her response provides psychologists with useful and interesting information about processes of challenge and their relationship to intellectual development. In essence, challenge is a developing relationship that is defined on the one hand by objective factors (a person and a problem), and on the other hand by subjective factors (the person's attitude that considers the problem as a challenge). This concept was illustrated by case studies in which two five-year-olds were asked to enact the event of going grocery shopping for a birthday party. The two subjects, during individual testing, played the role of the "customer" and bought groceries, while the experimenter played an undirective role as the store "clerk." Each child was faced with the problem of having to determine which items to select and which to reject. The children's spontaneous verbal and nonverbal activity was recorded on videotape for analysis. The speech utterances were coded according to six different functional types: (1) word play and repetition, (2) emotional exclamations, (3) issuing commands to objects, (4) describing one's own activity, (5) questioning and answering oneself, and (6) verbalizing plans and thoughts. The analyses demonstrated that children not only respond to their own questions by supplying themselves with answers but also respond to intellectual challenges by supplying themselves with questions, thus narrowing down the problem and deflating the challenge. (HOD)

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THE DEVELOPMENT OF QUESTIONING AS A MEANS OF FRAMING PROBLEMS AND POSING CHALLENGES

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When a person encounters a problem, the character, form, and content of his or her response provide psychologists with useful and interesting information about processes of challenge and their relationship to intellectual development. By the very act of retreating from a problem, for example, a person indicates that he is giving up his activity without a struggle, and that he does not regard the problem as intellectually challenging. In contrast, by the very act of engaging a problem, a person reveals that he regards it as a challenge to his emotional commitment to finishing the activity he started, and that he is determined to fulfill that commitment. In addition, the specific actions he performs in order to resolve the problem indicate that his intellect has been challenged as well.

The concept of `challenge´ that I am suggesting is unlike prevailing views, that basically regard challenge in terms of "external task demands" and problematic situations that stimulate goal-directed activity on the part of a subject. I maintain that challenging is a relationship between a person and a problem, a relationship that emerges and unfolds over time during the course of a problem-solving activity. This relationship is not set into motion automatically whenever a person and a problem meet. Rather, challenge is a process that arises only when a person regards a problem as a challenge. In essence, challenge is a developing relationship that is defined on the one hand by objective factors (i.e., a person and a problem), and on the other hand by subjective factors (i.e., the person´s attitude of regarding the problem as a challenge).

In this presentation, I will illustrate some of the ways in which chal-

lenge processes and cognitive processes unfold in the course of problem-solving, and some of the relationships they bear to one another. To illustrate this unfolding, I will present two case studies that were drawn from a previous investigation (Feigenbaum, 1985) that focused on the role of `private,´ or egocentric, speech in the development of children´s planning and problem-solving skills. In specific, I will describe how the private speech practice of `questioning and answering oneself´ serves as a vehicle for posing and meeting challenges and framing and resolving problems. Questioning oneself is <u>not</u> the only form of private speech activity that can be used to conduct these processes, but it is the form in which these processes are most clearly displayed.

According to Vygotsky (1962, 1978), private speech activity develops in a child as a response to circumstances that require him to think, and it provides him with a basis for solving problems and formulating plans. Private speech is a vehicle for self-regulation; a child speaks out loud to himself in order that he may become subject to his own commands and requests. There is growing empirical support for this view (e.g., Feigenbaum, 1985; Wertsch, 1979; see Fuson, 1979 for review). While Piaget (1955, 1962) personally did not agree with this interpretation, Beilin (1981) has argued that, within the bounds of Piagetian <u>theory</u>, there is every justification for the viewpoint that speech may play an important role in the development of symbolic activity.

In the two case studies that I am presenting, the task that the subjects were asked to perform was to enact-- in play-- the event of `going grocery shopping for a birthday party.´ The subjects, who were both five years old, were tested individually. During testing, each subject played the role of the "customer" and bought groceries, while the experimenter played

an undirective role as the store "clerk." The instructions that were given to each child are as follows: "Let's pretend it's your birthday today. If you go shopping at the play grocery store over there and get only those things that we need for a birthday party, then we can have a play birthday party, okay? I'll hold the grocery bag, and you get only the things we need for a birthday party." Thus, each child was faced with the problem of having to determine which items to select and which to reject. The spontaneous verbal and nonverbal activity that was produced by each child as he or she made grocery selections was recorded on videotape for subsequent analysis.

Because the phenomenon of private speech is controversial, let me briefly explain how the videotaped speech data were analyzed, how private speech utterances were identified, and how they were developmentally categorized. The stream of speech recorded on each videotape was first transcribed and then, with the aid of the written transcript, segmented into individual utterances using Dore's (1977, 1979) method of Conversational Act (C-Act) analysis. The next step was to determine whether each utterance was intended as private or interpersonal speech, since most of the videotapes contained a mixture of the two types. To accomplish this, an examination was made of the speaker's direction of gaze as each utterance was performed. If the speaker's gaze was directed at the experimenter even briefly-- or, in the absence of eye contact, if vocatives and `attention-getters' were present-- then the utterance was coded as interpersonal speech; but if the speaker's gaze was directed at something he himself was doing, then it was coded as private speech.

Next, each private speech utterance was categorized in terms of its function using a revised version of the category system originated by Kohl-

berg, Yaeger, and Hjertholm (1968). The category system was composed of six different functional types: 1) word play and repetition; 2) emotional exclamations; 3) issuing commands to objects; 4) describing one's own activity; 5) questioning and answering oneself; and 6) verbalizing plans and thoughts. Finally, after each utterance was coded, these categories were collapsed into two basic classes of private speech use: `emotive and descriptive' (categories 1 through 4) and `planful' (categories 5 and 6).

Now that I have set the stage, let me present an extended private speech monolog produced by one girl as she surveyed the play grocery items for sale on the table in front of her. The experimenter stood behind her and remained silent as she proceeded to talk to herself:

> Hmm... candles! (She takes them) And we need birthday hats! (She takes them) And balloons! (She takes these as well) ... and hmmm... a present! (She laughs as she holds it) ...and... (She picks up soap) No! (She puts the soap back) ...hmmm... [What else do we need for a birthday party? Hmmm... (She sees the toy pineapple) We don't need that!] (She laughs, and then notices the cereal box) [Do I need that? We don't need that!] ...Hmmm...

The episode ends when she turns to the experimenter and says: "And that's about all we need for a birthday party!".

The first point I would like to make is that there are two question-answer episodes in this monolog, and both occur toward the end of the activity, when the pressure to terminate the grocery selection process is most acute. Up until the question-answer episodes, the child had made several grocery selections, and her use of private speech was limited to naming each of the items as she happened to notice them. But in order to bring the selection process to a close, she was challenged to check her activity and

make certain that she had selected all the appropriate items. To this intellectual challenge she responded with the question: "What else do we need for a birthday party?" Her first reaction to her own question was to look at the remaining grocery items; noticing the pineapple, she was then moved to respond to her own question with: "We don't need that!" This answer served to reject the item and bring the activity one step closer to completion.

The second question-answer episode builds upon the first. Having rejected the pineapple, the problem was narrowed down a bit, and consequently the challenge was eased a bit. The girl's first response to this somewhat altered challenge was to once again visually scan the items to see if she was indeed finished with the activity. When she noticed the cereal box, she responded by asking herself the question: "Do I need that?" Unlike the first question-answer episode, there was no hesitation in answering herself this time: "We don't need that!" With this second answer came a second rejection, which seemed to convince her that she had done her job adequately, for her very next utterance was to the experimenter, informing him that she had completed the task.

This monolog illustrates nicely the unfolding of the relationship between challenge processes and cognitive processes. The first question that the child generated indicates that she was responding to a challenge to be thorough in performing her activity. It is almost as if she were responding to the question: Am I done? The answer that she supplied to the first question yielded factual information that helped her to narrow down the cognitive problem to a small degree. Consequently, the second question responds to a slightly different situation, one in which the problem is closer to a resolution and the challenge is less pressing. As in the first

episode, the answer that was solicited by the second question helped to narrow down the problem even further, making the process of decision-making somewhat easier. Interestingly, although the two question-answer episodes resulted in the rejection or elimination of only two items, leaving many items verbally unaccounted for, the two episodes seemed to have a cumulative effect, for the child's next utterance served to end the search altogether.

Let me present another example. This private speech monolog was produced by a young boy who showed lots of imagination:

> We need to get a lot of fruit... for the cake... to make it before the party starts.... The party won't start until 2:00, so I have time to make it... at 10:00 o'clock in the morning. (He notices the birthday hats) Oh! Birthday hats! Just what we needed! (He pauses to survey the remaining items) Where is something else we need? ...That's all. (He notices the box of birthday candles) Oops! (He picks it up) There, see what we needed? Some pink candles. (He opens the box and begins to remove some candles) How many candles do we need? How 'bout five? Five candles we need.... One, two, three, four, five. (Then he replaces the box on the shelf, and takes the bag containing his selections over to the cash register, thereby ending the selection process).

The first point I would like to make with respect to this example is that it beautifully illustrates how private speech can function not only as an instrument of serious thought, but also as a vehicle for fantasy and play. In the first half of the monolog, which builds up to the second half containing three questioning episodes, this boy produced a series of statements that served not only to justify his rather fanciful choice of fruit, but to plan the upcoming birthday party activity as well. When he

happened to notice the birthday hats, he was invited to say their name aloud, which in turn led him to comment: "Just what we needed!" With these words ringing in his ears, the child suddenly developed a more serious tone and scanned the grocery items intently. As he did this, he asked himself: "Where is something else we need?" The sudden challenge to his shopping activity that this question reflects evaporated almost as suddenly when he answered several seconds later: "That's all."

As for the second question-answer episode ("See what we needed? Some pink candles."), the child uses private speech to justify his selection. Then, as he spoke of candles, he began removing them from the box, and he was challenged to ask himself about where his activity was headed: "How many candles do we need?" He answered this question with another ("How 'bout five?"), reflecting that the challenge was not yet over. The problem was finally settled when he answered his question with a statement. This statement then served to set up the counting sequence that immediately followed.

What I have tried to demonstrate with these examples is that children not only respond to their own questions by supplying themselves with answers, but they respond to intellectual challenges by supplying themselves with questions. I described how responding to a problem as a challenge leads to asking a question, and how asking a question produces an answer, which serves to narrow down the problem and thus deflate the challenge. The point of view I am expressing is compatible with Piaget's (1980) notion that cognitive `disequilibrium' is an important factor in development. Piaget proposed that if the level of intelligence that is required to resolve a problem exceeds a person's existing level of cognitive development, then cognitive disequilibrium is implied. This imbalance fosters, under the pro-

per conditions, efforts on the part of the person to achieve a new state of equilibrium, efforts that are specifically directed at solving the problem at hand.

To conclude, it would appear that in order for a child to master the process of questioning, one of the things he or she must learn is to identify the conditions under which it is appropriate to ask questions. I, for one, am challenged to ask: What are those conditions?

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